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WORK MEASUREMENT IN THE U. S. MARINE CORPS

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TABLE OF CONTENTS

Chapter		Page
I	Introduction	1
II	The Reasons For Work Measurement	3
III	Determination Of The Work To Be Measured	7
IV	Selection Of The Work Units	11
V	Selection Of The Time Unit	15
VI	Conclusion	18

CHAPTER I

INTRODUCTION

This paper concerning Work Measurement is, for the most part, my concepts, ideas and feelings of the Work Measurement program as it has been put into effect in the Marine Corps. It is not intended to, in any manner, reflect thinking on this subject at Headquarters, U.S. Marine Corps. It is rather the ideas that I currently hold on this subject. I have no idea that these ideas will remain static and not change, but rather, that they will change as I go on with my studies on the subject of Work Measurement.

This writing is the product of the opportunity given to us officers to set ourselves apart and look abstractly at the work being done and that has been done in this area. I have no thought of any adverse criticism, but rather to try to point out certain defects which perhaps could be improved. The Marine Corps did not present its program as a "cure all" or "last word", but rather as a "fire alarm" so that management's mistakes may become apparent before any real loss had occurred. Much more will be said later with regard to management.

I wish to reiterate that these are my ideas as gained by actual experience with the Work Measurement Program, by talking with many people directly or indirectly concerned with the work, and of course, by my readings and studies.

This whole idea of some sort of a yardstick to compare

Peoples endeavors has been current around the "Hill" for some years. The Bureau of the Budget was one of the foremost advocates because of its assigned mission until the Management Office became top-heavy and was eliminated by the non-appropriation of funds.

Work measurement consists of various procedures for relating volume of work with employee time expenditure. The purpose of work measurement is the furtherance of three essentials of good management--clear accountability, efficiency, and economy.

People become interested in this type of thing when it becomes necessary that they justify the public funds they are spending.

On the other hand, people who are making public funds available are interested in some sort of a check to see that the most effective results are being obtained from public funds and to compare the monies spent by one agency of government with those of another who have similar work to preform. Of course, in industry the prime objective is more profit from the same labor but we are dealing entirely with governmental agencies.

CHAPTER II

THE REASONS FOR WORK MEASUREMENT

It may be well to point out the announced objects or the "why" of the program. It was the contention of many that the Marine Corps had been fulfilling their assigned mission and did not need this extra work added to already over-taxed staffs. The Marine Corps, however, announced a program for their Fiscal, Supply, and Personnel Departments and set about its fulfillment with not too much enthusiasm. The following advantages, it was pointed out, could be gained. The benefits to be derived from this program extend to all supervisory levels of an activity, from the chief of the smallest organizational unit to the officer in charge. The data obtained would be available to lower level supervisors, middle management, and to top management so there would be an understanding as to what constitutes the job efficiently accomplished. It was pointed out that without this information, management may fail to discharge its responsibility for control and proper utilization of manpower in the most effective manner. It was explained, too, that there would be great competitive interest as a result of periodic summaries of this data. The program would provide a factual basis for management control, which is that phase of administration which examines results to determine whether, and how well, work assigned has been accomplished in accordance with preconcieved plans and policies. Control provides management with the information necessary to make plans and to

carry on more effective operations. Control information is usually in the form of reports received from operative levels and forwarded through the various levels of command for evaluation and action. It was thought many activity improvements should result from the program. The program was designed to improve planning and controlling aspects of the administration. By comparing the current reports with previous reports it would be possible to note trends and thus determine the increase or decrease of efficiency. It is further possible, in many cases to compare the performance of similar operations in different activities during the same period of time. This later possibility is the area in which Work Measurement has thus far best been able to serve the Marine Corps. The program should act as a signaling system to bring trouble to the attention of management. Some of the more common trouble spots which may come to light by use of the program are: improper personnel utilization resulting from over-staffing, use of inefficient methods of work by individuals, the organization of the activity may not provide a healthy system of working relationships, and some routines may be discovered that could be systematized or eliminated entirely. The Citizens Advisory Commission on Manpower Utilization In The Armed Services is presently investigating along these lines. It is the genuine hope of the Defense Department that they can present some constructive criticism. The work done in this area embryonic and incomplete as

it is will undoubtedly be reviewed by this commission. The program provides a factual basis for management planning. This is the phase that determines when, where, how, and by whom future work will be performed. By applying performance experience to the estimated load, it is possible to estimate the number of people it will take to do the work in a given time. This technique is particularly useful, not only in estimating personnel requirement, but also in shifting employees from one department to another or even from one activity to another to meet anticipated work loads. Work Measurement data can be used to develop realistic work schedules.

It was explained by the people sent to the field by the Marine Corps to do the orientation work and to put into effect. the Work Measurement Program that there would be many future products result from the program. Some of these likely products are:

1. Better classification and more detailed defination of functions and work unit.
2. More precise measurements.
3. Simplification of work and a simplification minded organization.
4. Better job description and a more effective training program.
5. Employment of time, study, and motion and method studies where applicable.
6. Employment of methods--time--measurement and other advanced management engineering techniques to determine specific standards.

7. establishment of more direct and indirect incentives to increase productivety. 1

As a further part of the program, it was recognized that review was needed not only to determine the adequacy of the work measurement program, but also to determine whether the work which is being measured is necessary. Follow-up is needed for policing the program.

The next chapters are devoted to some of the considerations that the Marine Corps dealt with in evolving their programs. Much attention was given to the Navy Department Program and also to those other agencies that had done work in this field. The Bureau of the Budget, the Department of Agriculture, and Army have had Work Measurement methods for several years.

1 Marine Corps Supply Department, Instruction for Supply Work Measurement, October 1951, pp. 17-18

CHAPTER III

DETERMINATION OF THE WORK TO BE MEASURED

The work measurement program consists actually of two major considerations--the work that has been accomplished, expressed in adequate work units, and the man hours expended in the accomplishment of this work. Accordingly, the collection and evaluation of these two groups of data provide the heart of the program. What work can an organization properly count or measure?

The Bureau of the Budget answers these two questions by noting that in deciding what work an organization wants to measure is roughly the same as deciding what level to measure, and by first determining the level to be measured, help is provided in narrowing down the final search for the work units that can be properly counted. "To put it another way, desireable units of measure are not always valid units; but, by elimination, the units that are both desireable and valid may be more rapidly located if as a first step, those that are desireable in terms of the purposes for measurement are identified. And, that identification can be done by selecting the level for measurement." 2

A review of organizational charts may be helpful in classifying the functions of an activity for measurement purposes. When the work performed by organizational units is sufficiently alike in type and scope, the program may be set up on an organizational basis.

To provide a concise answer as to the level of measurement

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2 Bureau of Budget, Executive Order of the President, A Work Measurement System, pg. 3

and to emphasize its importance the following is quoted from the Army Service Forces Control Manual for Work Measurement:

> The two major considerations governing the extent to which functions should be subdivided into component operations for work measurement are--
>
> (1) The number of persons engaged in the various functions. Those functions involving the largest number of persons should be selected first. If, after applying measurement to a function it is found that subdivisions are justified, the finer breakdown can be effected as a refinement.
>
> (2) The degree to which the work of the operation or function is composed of differing types of work, the work units of which require substantially different man-hours to complete. If these types are present in the same proportion from month to month, a single work unit can be used to represent the work load of the operation or function. If it is desired to establish a common standard for several activities, and the proportion of the types of work units differs substantially between such activities, it will be necessary either to use multiple standards or split the functions into its components. The latter is desireable if effectiveness for each component is desireable continually and the number of people working on the individual work units warrants the finer breakdown.
>
> Function and operations should be developed along functional rather than organizational lines. Only in this way is it possible to obtain an accurate measurement of the performance of like functions, regardless of where they are carried on within an organization. It is not intended that organizational structures be altered to conform with the functional work measurement plan. Likewise, it is not intended that the structure of the work measurement plan be altered to conform with organizational changes. 3

3 Army Services Forces, Department of the Army, Control Manual Work Measurement, (Washington, October 1945) p. 9

Various agencies and Bureaus have come up with many systems in classifying the work of an agency for work measurement purposes. The Bureau of the Budget points out that there are three commonly accepted methods for accomplishing their objectives:

1. Classifying the work according to organizational entities.

2. Classifying the work according to a breakdown of individual processes or steps.

3 Classifying the work according to functional, sub-functional process, or operational description. 4

This is essentially the same as the Army Service forces.

Along with deciding at what levels to measure and whether to do it by functional or organization methods it is also equally important to recognize that all work is not measureable in units. A number of situations require personnel staffing which is based on arbitrary factors or unalterable conditions. The following are examples:

1. Statutory provisions, such as a definite number on a board.

2. Organization structures, as for example chiefs of bureaus and their personal staffs.

3. Open-end objectives of unpredictable results such as research.

4. Fixed installations operated for a clientele irrespective of work volume.

It is rather obvious that high level administrative posi-

4 Bureau of the Budget, Executive Office of the President. Techniques for the Development of a Work Measurement System

tions will most likely never report details of their time expenditure or in other respects be susceptible to inclusion in a work measurement program.

The idea of any sort of work measurement is only frustrating to the scientist. This is substantiated by the stand which scientific people take in discussing work measurement. You can't escape the fact that there is a certain element of investment in research which you can't put your finger on, yet we know it is a profitable risk. Seemingly, the greatest advancement that can be made in this area is that of educating scientific people along organizational lines. Scientific research and development seems too important to leave exclusively in the hands of the scientists.

"The amount of unmeasured work should be held to a minimum. In other words, the number of man-hours chargeable to those categories of work for which no adequate work unit can be found, or which for some other reason cannot be measured, should constitute as small a percent as possible of the total man-hours of work at the activity." 5

5 Bureau of Yards and Docks, Department of Navy, Public Works Type Function Work Measurement Program. p. 9

CHAPTER IV

SELECTION OF WORK UNITS

Having determined the advantages of Work Measurement and the benefits that can be derived from its implimentation and having determined the level of work that it is reasonable to measure, we now come to the most difficult thing regarding Work Measurement--the selection of the proper work unit. The selection of specific units of work which are countable and which are representative of all effort being expended in the work area, is indeed complex. The problem is intensified when it is the desire to compare one activitys work with another that is in various parts of the world. Conditions always differ.

The Bureau of the Budget lists the following criteria that may be used in selecting valid work units for measureable work:

1. The work unit must express output; that is, volume of work completed, such as a case processed or a letter prepared.

2. The work unit must be countable; that is, expressed in quantative terms, such as a case, a letter, or a file drawer.

3. The work unit must reflect work effort. The work unit which measures the results of work performed does not necessarily measure the effort expended in performing that work. For example, results of processing license application may be in terms of number of licenses issued, whereas work effort might be measured in terms of applications processed; for if a large number of applications are rejected, there may be a very appreciable difference between the license issued and the application processed.

4. The work unit must have consistency; that is, the unit must have the same meaning throughout the organization and from one period to another. It should be possible to compare work measurement results from one part of an agency at any given time with results from other parts performing the same type of work as well as to compare the results in a single operation on a time trend basis. The quality specification of the work performed must be consistent over a period of time. In other words, the same work must be measured in the same work units by the same methods of counting and reporting.

5. The work unit must be expressed in familiar terminology--familiar, that is, to those who will be responsible for maintaining the work load reports. 5

On the basis of this criteria, it appears that most advantageous levels of measurement would be either the operation or process level, since generally a single product or several closely related products which represent the culmination of many steps in the procedures of the organization.

It must be recognized that there is a vast difference between work volume, results, and accomplishment. The work load count resulting from the use of work units will normally express out-put of work and not necessarily results or accomplishments. There are many things which these figures will not tell us but do provide a basis for analysis that may answer certain questions.

The distinction between constant and variable work units must be made when considering the method to account for work.

5 Bureau of the Budget, Executive Office of the President, A Work Measurement System, p. 15

After the unit has been selected it must be tested for validity. These tests are necessary because some examination of the adequacy of the work unit selected should be made before standards are set. Should the standards, when developed, indicate a possibility that the work units are inadequate, procedures should be available to further analyze that possibility.

"The validity of a work unit as an effective measure of work accomplished depends on whether its demands on labor-time (manpower) varies proportionately with the changing volume of work accomplished for appropriate and continuing periods of time."[7]

Another test for validity of the selected work units is to record the number of work units accomplished and the time expended in performing the work being measured at several different, but comparable, activities. From these data, the time expenditure per work unit is determined by dividing the time expended in performing the measured work by the number of work units accomplished.

A third test which is frequently used in a visual portrayal on graph paper of the relationship between work units accomplished and time expended in performing the measured work. This is done by time expenditure on a vertical scale of the paper, and the work units completed on the horizontal scale. When this is done, a distinct pattern should be visible in the case of adequate work units.

The Marine Corps' Work Unit is defined as an item or a

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7 Office of Chief Signal Officer, Department of the Army, Signal Corps Cost and Productivity Program, p. 14

group of items, generally physical, which when taken in the aggregate, serves to measure amounts of work." The next unit of measurement and certainly a controversial one is the Line Item, which is defined as an entry in a catalog or a document. Quantity of the particular line item is not considered in the number of line items. For instance, one tractor or fifty tractors, if listed on a document as one individual entry, would constitute only one line item. Thus, all work done in a particular function, such as stock control, storage, etc., is represented by one work unit for that function as "Line items processed."

CHAPTER V

THE APPROPRIATE TIME UNIT

When the Work Unit has been set the next task is to set time-standards or time units. The collection and reporting of time should be as simple as possible. The selection of a time unit which can be easily recorded by the person doing the work or keeping the time count and easily reported for analytical purposes is, therefore, important. The time unit should be such as will permit a worker to report the time expended on each type of work on as nearly an actual basis as possible, and in general, daily.

"It is pointed out that: If daily recording of time is not required, there is a tendency for employees to wait until month-end or week-end to distribute his time. When employee time was actually expended in a number of different types of work, the distribution would be purely and simply the employees' best guess." 8

Possibly, the most important consideration is the necessity for the time unit which is selected to reflect accurately the actual time which has been expended in the accomplishment of the work units which the time is being reported. This is to say that the time unit must permit segregation of non-productive time as against productive time, must permit adjustment for overtime, and should permit accurate assignment of productive time to the areas of work which are being measured.

The man-hour meets most of the requirements and seems to

8 Bureau of Budget, Executive Office of the President, Techniques for the Development of a Work Measurement System, p 32

work in actual practice. The man-hours of each worker can be recorded daily by the worker or time-keeper, and these man-hours can be charged properly to the correct area of measurement at the time of recording. This lends its self to verification against payroll and leave records. The use of the man-hour as the time unit for work measurement purposes appears to provide simplicity and to reduce, to a minimum, the recording of time by each employee.

The Marine Corps uses the Man-hour unit and gives the following example to demonstrate its use:

"An additional monthly workload of 10,000 work units is anticipated. Divide the number of work units by the work units per man-hour which past experience has shown will be required to perform that type of work. For instance, if this work unit per man-hour figure is 2.5, it will take 4,000 man-hours to accomplish an additional workload of 10,000 units. Adjustment can be made for the known ability and experience, or lack thereof, of the employees to be assigned to the job, and expected absences, administration, etc. If the work-month makes available 168 man-hours per worker, then the number of people required would be the adjusted required man-hours divided by 168.

The procedure shown in the above paragraph can likewise be applied to determine personnel decreases when the workload within a function does not justify retention of the total current personnel.

The difference in the total man-hours required to complete the known workload over man-hours presently on board provides in multiples of 168 monthly hours the approximate number of additional positions needed to keep the work current. The possibility of transferring personnel or re-scheduling work should not be over-looked.

The number of man-hours required to perform a function is obtained as shown. If the man-hours required are divided by the daily man-hours of the personnel to be used on the job, the result is the number of work days required to complete the job.

A comparison of man-hours required to complete a known workload under new procedures and equipment with that required under former methods will reveal part of the savings or loss resulting from the new installation or revised procedures, methods or techniques in performing the operation."

CHAPTER VI

CONCLUSION

I have attempted to show what some people think Work Management is suppose to be by presenting several current ideas. The several benefits that may be derived from its use, such as locating trouble areas, inefficiency, and for planning purposes, etc, have been pointed out. The method for selecting the proper level of work to measure was dealt with and that top level administrators and certain types of workers did not lend themselves well to measurement, was discussed. The selection of a Work Unit, its varification and use was pointed out as being a most important fact as is the correct selection of the Time Unit. Much amplification could be put on anyone of these topics, but it isn't the purpose of this paper to deal in detail as in a technical writing.

As is generally known by all management, there is much to be said for Work Measurement. however, I don't think the present system as put into use by the Marine Corps can fulfill all the claims made for it. As was said earlier, it was the opinion of many top level officers that the Marine Corps was fulfilling its assigned mission, and that the citizens were getting value received from their tax dollar. This was looked upon as only another report required by Headquarters that was made little or no use of after it reached its destination which was the already-bulging file cabinets.

At the level where this Measurement work has to be done,

it is difficult for the employees to comprehend the good that can be gained. It is something that needs to be lived with and worked with daily to impress upon every worker that they are the basis of all good that can come.

The resentment that comes from any worker whose employer attempts to measure his work is very apparent with the government worker. They, in many cases, do not lend their needed cooperation and express their feelings by the exact recording of minutes spent at the lavatory.

There is needed, therefore, a complete and sincere "selling program" necessary if Work Measurement is expected to take its place in Marine Corps management. This "selling program" should not be too articulate or enthusiastic because, as has been pointed out, Work Measurement isn't the type of thing that is taken to by all management.

Work Measurement was put into effect in the Marine Corps Supply Department at a poor psychological time. The Depots were already overtaxed, and in some cases, under-staffed, in their effort to support the Korean "police action". Many supply sections had to take men from their regular duties, and assign them to this reporting function from which no immediate good could seemingly come.

It is doubted very strongly if the information flowing monthly into Headquarters Marine Corps is used to determine personnel requirements or to justify budgetary requests, or

for any of the other advantages that are supposed to be gained. The information is found elsewhere in already existing and more digestable reports.

We do have, however, a measuring program that can qualify as such if asked by any Congressional Committee, and it does, seemingly, satisfy the Defense and Navy Department requirement.

I have made no attempt to explain or discuss the Navy Shore Establishment Work Measurement System which is supposed to be put into effect early in 1953. This program will be adopted by the Marine Corps, and I am sure it will be a step in the right direction.

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